## REMARKS

In the Office Action, the Examiner rejected claims 1-28 pursuant to 35 U.S.C. §103(a) as unpatentable over Hall, et al. (U.S. Patent No.6,071,240) in view of Hollman, et al. (Coherence Factor of Speckle . . .). Claims 30-34 were rejected pursuant to 35 U.S.C. §103(a) as unpatentable over Hall, et al. in view of Hollman, et al. and further in view of Rigby (U.S. Patent No. 5,910,115). Applicants respectfully request reconsideration of the rejections of claims 1-28 and 30-34, including independent claims 1, 13, 16, 27, 30 and 34.

Independent claim 1 recites obtaining data from a plurality of transducer elements across a receive aperture, determining a coherence factor as a function of the data across the receive aperture, and setting a beamforming parameter as a function of the coherence factor.

As noted by the Examiner, Hall, et al. do not disclose setting a beamforming parameter as a function of the coherence factor. Instead, Hall, et al., suppress incoherent data by adjusting signal amplitude (abstract; col. 3, lines 5-18; col. 7, lines 30-32; and col. 9, lines 1-8).

Hollman, et al. are relied on to suggest adjusting the beamformer parameters shown in Hall, et al. Hollman, et al. show that coherence factor relates to image quality (abstract; and page 1260, col. 1). To test the relationship between coherence factor and image quality, a phase distortion is introduced and may be corrected iteratively (page 1259). Hollman, et al. use phase to iteratively correct coherence (page 1259). To determine the phase correction, a correlation coefficient is used to determine a phase error (page 1259, col. 2). The correlation coefficient is calculated from a correlation of the element signal with the coherent sum (page 1259, col. 2). Hollman, et al. rely on a correlation or comparison of phase of an element signal to a coherent sum signal to determine the phase. This correlation of the element signal with the coherent sum is not a coherence factor. Coherence factor is used by Hollman, et al. to determine whether to alter the phase, but the correlation is used to determine how much to adjust the phase. To use the phase correction of Hollman, et al., the phase is not set as a function of the coherence factor.

Hall, et al. use the incoherent sum compared to the coherent sum. This coherence factor does not indicate a phase for an element. A person of ordinary skill in the art would not have used the phase correction of Hollman, et al. to be set as a function of the coherence factor of

Hall, et al. The coherence factor does not provide the relative phase error relied on by Hollman, et al. to set the phase correction.

Independent claim 13 recites a beamformer parameter responsive to the coherence factor. Claim 13 is allowable for similar reasons as claim 1.

Independent claim 16 recites setting an image forming parameter as a function of the coherence factor, the image forming parameter being for synthesis, multibeam, a number of sequential beams, a number of sub-apertures, a number of focal zones or combinations thereof.

As noted above, Hall, et al. suppress or change the amplitude based on the coherent and incoherent sum comparison. The coherent sum, incoherent sum, or a combination of both may be used for the image. As noted by the Examiner, Hall, et al. do not disclose the image forming parameters of claim 16 being a function of the coherence factor.

Hollman, et al. relate image quality to coherence factor. Phase may be manipulated to adjust coherence. Phase is adjusted based on a correlation of an element signal to the coherent sum. The change in coherence alters image quality. Hollman, et al. do not disclose the image forming parameters listed in claim 16, and do not disclose setting the parameters as a function of coherence factor.

Both Hall, et al. and Hollman, et al. fail to disclose the recited image forming parameters, so claim 16 is allowable. A person of ordinary skill in the art would use the amplitude adjustment of Hall, et al., not the listed image forming parameters, based on the coherence factor since Hollman, et al. test quality with coherence factor but set phase based on correlation and Hall, et al. use amplitude as the solution to the same problem. Phase and amplitude are adjusted. Phase and amplitude are not synthesis, multibeam, number of sequential beams, number of sub-apertures or numbered focal zones. There is no suggestion that a different modification, especially the more complex image forming parameters of claim 16, should be adjusted.

Independent claim 27 is allowable for similar reasons as claim 16.

Independent claim 30 recites setting dynamic range, a nonlinear filter, or a nonlinear map as a function of the coherence factor. As noted by the Examiner, Hall, et al. and Hollman, et al. do not set a non-linear map as a function of the coherence factor.

Rigby, like Hall, et al., does not disclose these limitations. Hall, et al. is a CIP of Rigby and generally includes the same information cited in Rigby. Since Hall, et al. do not disclose these limitations, the parent patent Rigby does not.

The cited portion (col. 5, line 26 - col. 6, line 15) of Rigby discloses mapping the coherence factor (see col. 5, lines 39-47 in particular). The mapping outputs a value for a display pixel based on an input coherence factor. Rigby and Hall, et al. use a map to map coherence factor, but do not set the map as a function of the coherence factor. One of different maps and dynamic range are not set based on coherence factor. Rigby does not disclose the limitations of claim 30.

The Examiner alleges that the procedure of Rigby is to set up a filter based on coherence and map the coherence factor. The filter 62 is not set based on coherence factor, but instead spatially filters the coherent sum (col. 5, lines 65 – col. 6, line 3). Filtering is not setting a filter. The filter is not programmed or selected based on the coherence factor. Similarly, Rigby uses a map (col. 5., lines 39-40 and 50), but using is not setting. Rigby does not set a map or filter as a function of the coherence factor.

Independent claim 34 is allowable for the same reasons as discussed above for claim 30.

Dependent claims 2-12, 14-15, 17-26, 28, and 31-33 depend from one of the independent claims discussed above, so are allowable for the same reasons. Further limitations distinguish from Ustuner, et al.

Claims 3 and 19 recite calculating phase variance across transducer elements. Hall, et al. use beam sum to determine coherence, and do not calculate phase variance. Col. 6 shows beamforming and col. 7 shows using coherent data, which has phase information. Neither shows calculating phase variance across elements. Hollman, et al. use beam sum, not phase variance, to determine the coherence factor. Hollman, et al. determine relative phase of an element signal to a coherent sum, but this is not phase variance across elements. Even were correlation of Hollman, et al. is performed for each element of the aperture in the iterative process, the variance at each element from the sum is determined. The variance across elements is not calculated.

Claims 5-10, 12, 15, 17, 21-26, and 31-33 all recite specific parameters set as a function of the coherence factor. Hall, et al., Hollman, et al. and Rigby may use some of these parameters in general, but do not set them as a function of the coherence factor. Hall, et al. and Rigby teach a feed-forward system that changes amplitude or not based on coherence. Hollman, et al. relate quality to coherence and adjust phase based on correlation.

Claim 11 is allowable for the same reason as claim 16.

## CONCLUSION

Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully requested to call the undersigned at 650-694-5810.

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Date: ___October 12, 2009______________